

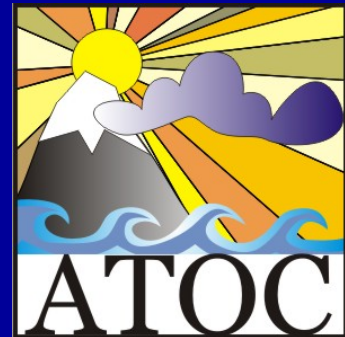
Comparison of AMPS MM5 and AMPS WRF Forecasts Using Self-Organizing Maps

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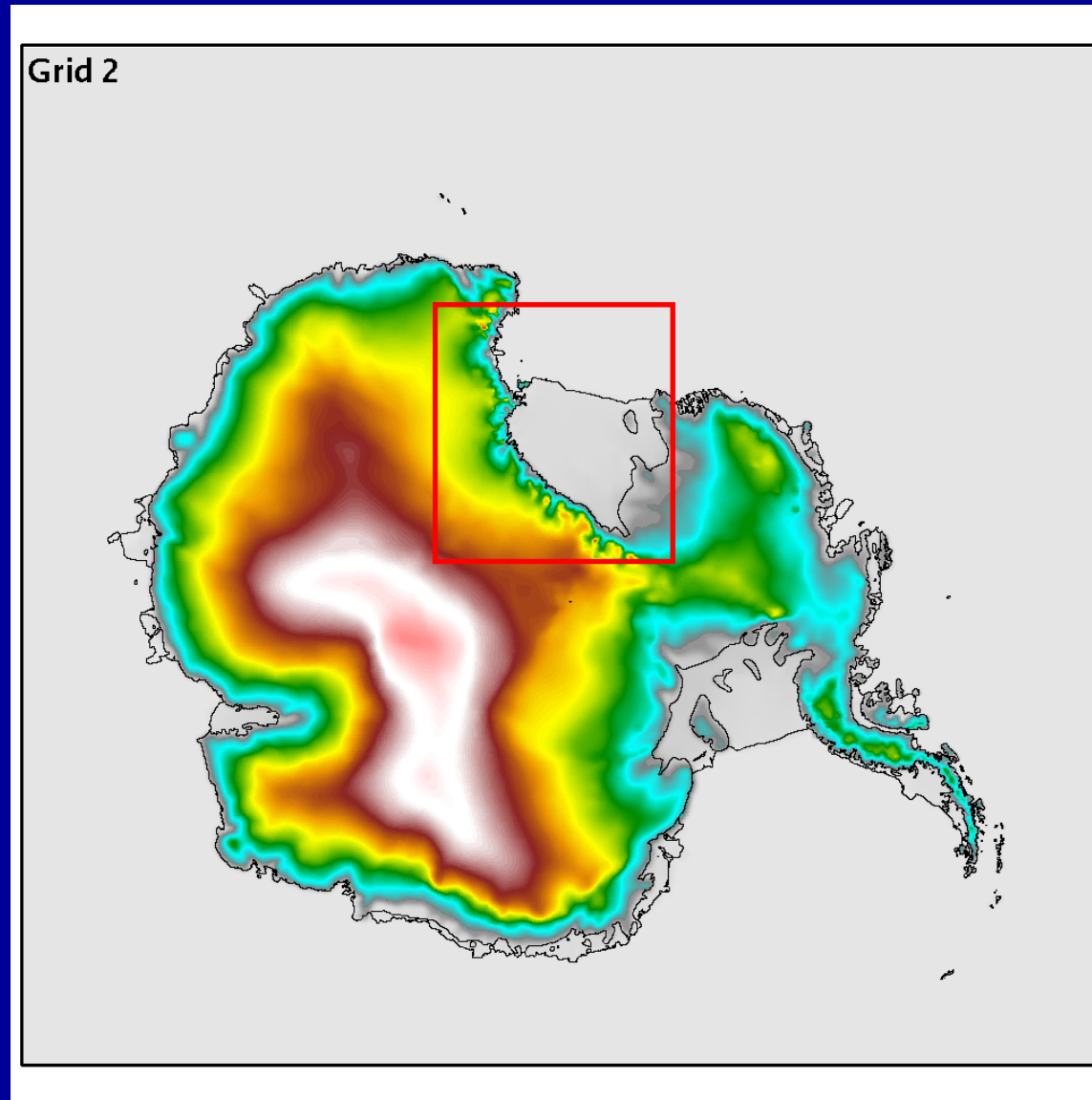


Project Goals (Part 1)

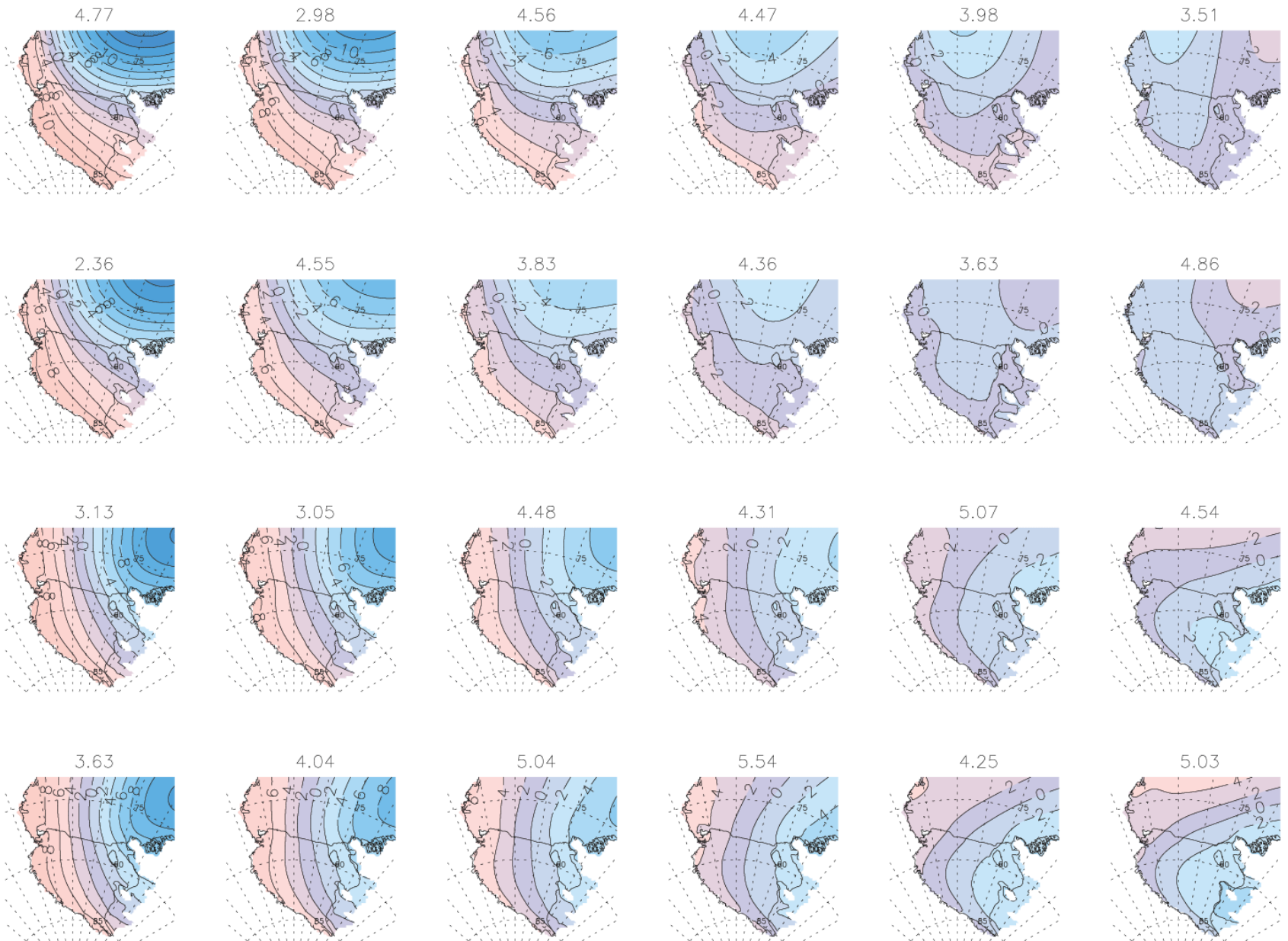
- Develop SLP synoptic climatology based on AMPS output
- Evaluate AMPS forecasts from a “synoptic” perspective
- Work completed to date
 - Compare MM5 AMPS and WRF AMPS forecasts
 - Evaluate changes in frequency of forecast synoptic patterns as a function of forecast duration
 - Calculate percent of time that predicted synoptic pattern matches what was observed
 - Identify misprediction of synoptic patterns

Data for SOM Analysis

- SLP over Ross Sea sector of AMPS
20 km model domain
- Data from both MM5 and WRF AMPS simulations
- Use forecasts from 2007 and 2008 field seasons
 - 1904 model valid times
 - 11424 forecasts from each model
 - 22848 total forecasts
- Evaluate forecasts at 12h intervals
 - 000: 0, 3, 6, 9 h
 - 012: 12, 15, 18, 21 h
 - 024: 24, 27, 30, 33 h
 - 036: 36, 39, 42, 45 h
 - 048: 48, 51, 54, 57 h
 - 060: 60, 63, 66, 69 h



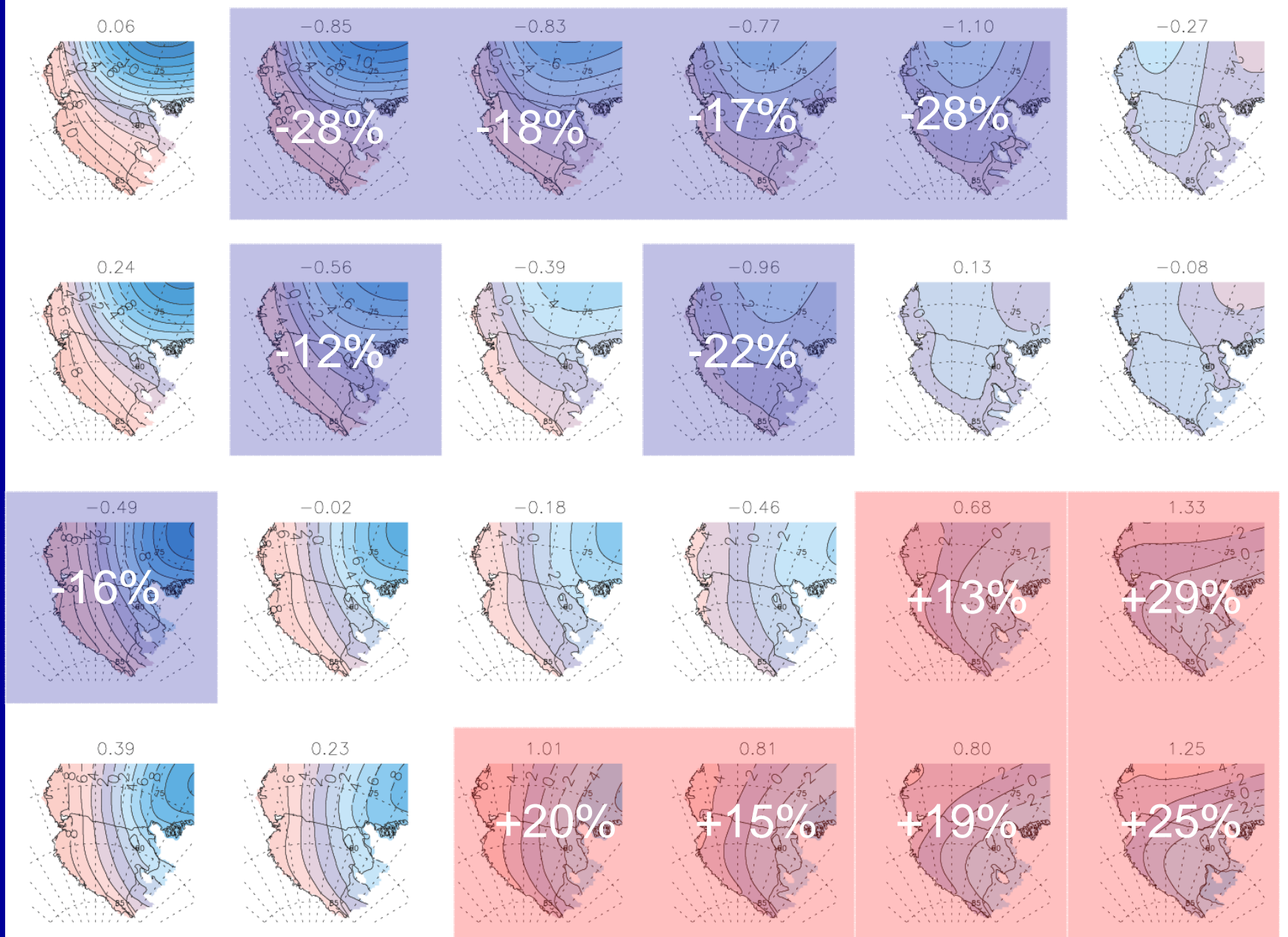
Ross Ice Shelf SLP Synoptic Climatology: WRF AMPS



WRF node frequencies all

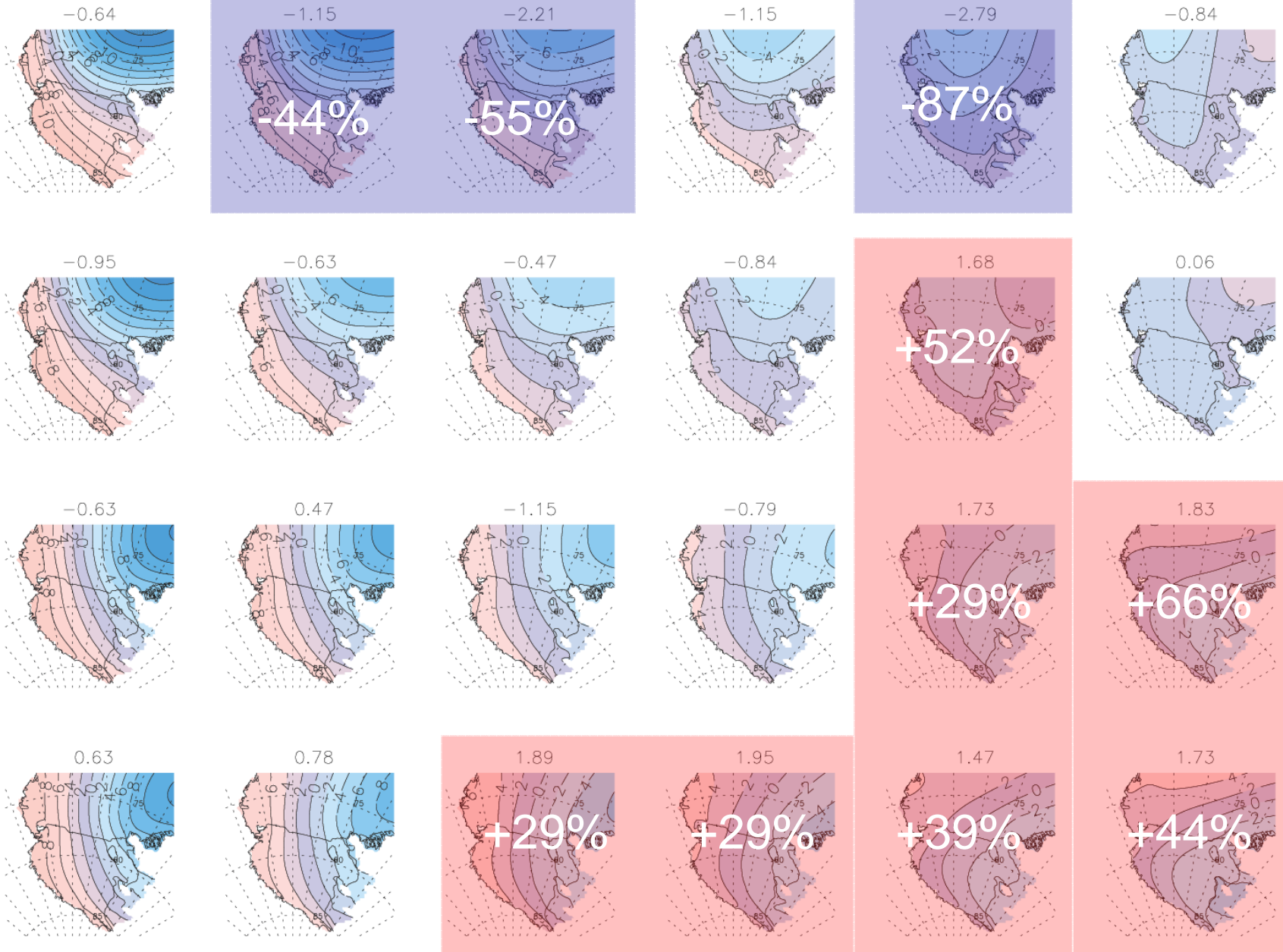
Comparison of WRF AMPS and MM5 AMPS Forecasts

WRF AMPS vs MM5 AMPS Forecasts: All Times



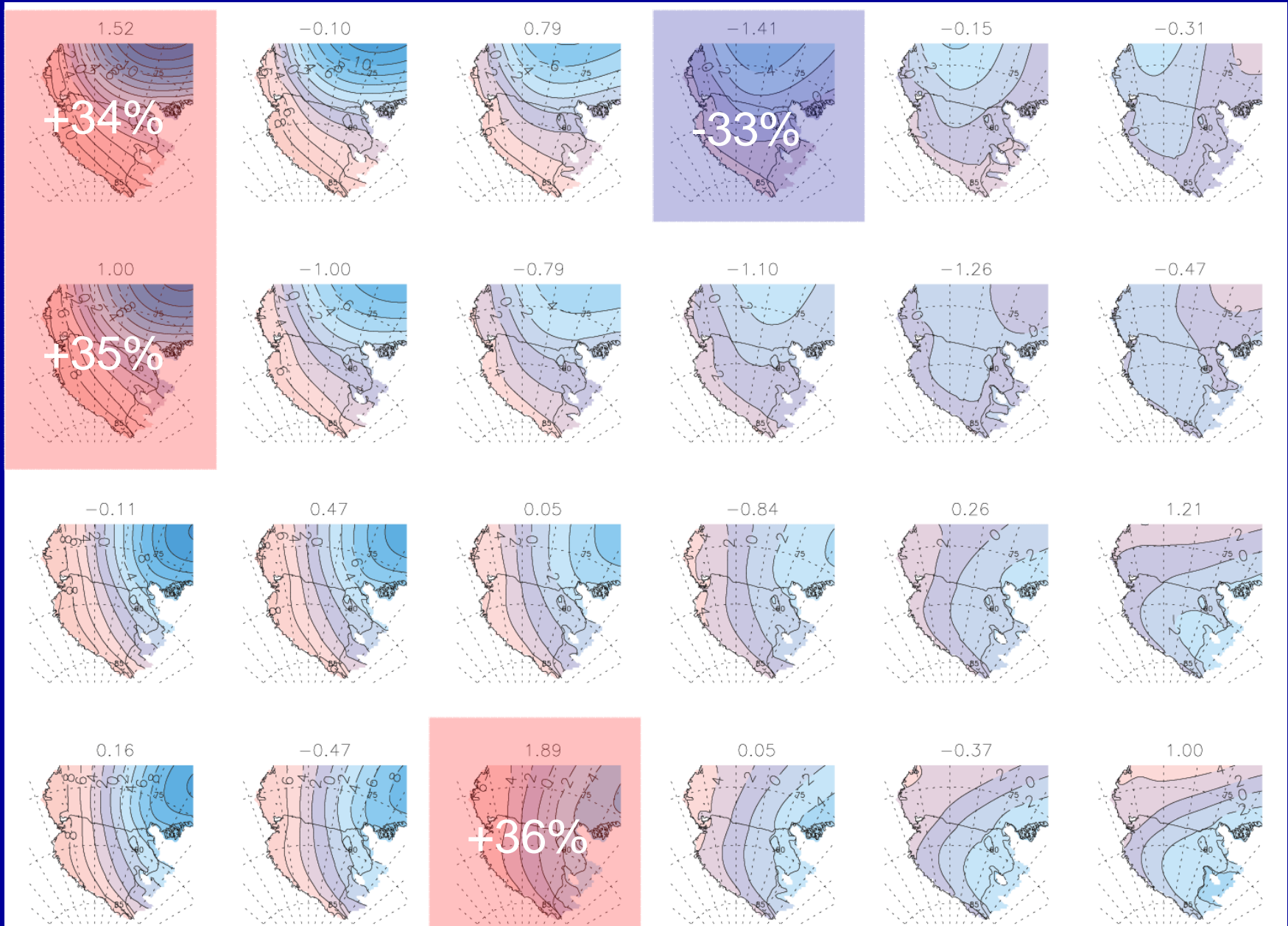
All node frequencies WRF-MM5

WRF AMPS vs MM5 AMPS Forecasts (012)



WRF-MM5 node frequencies 012

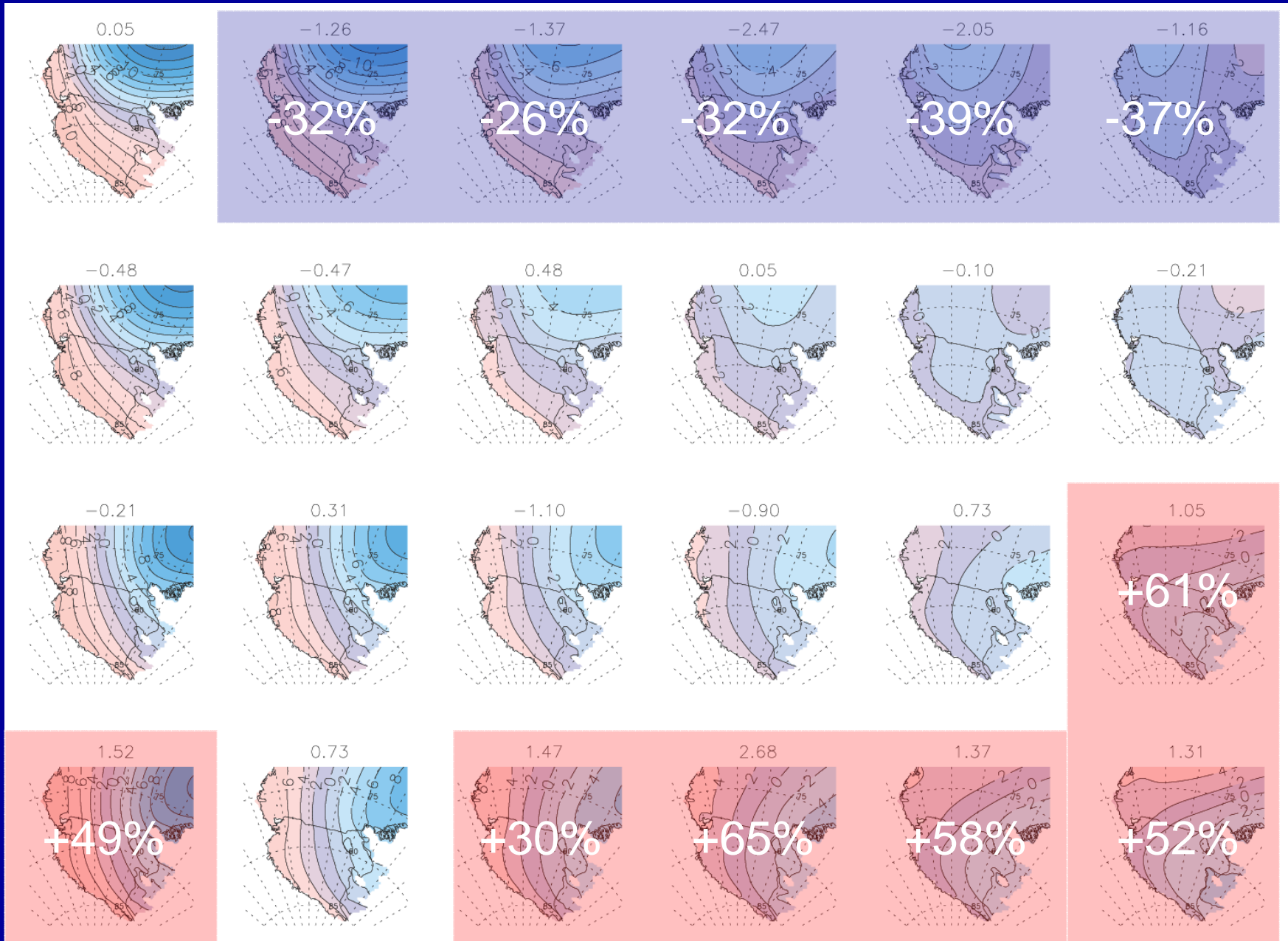
WRF AMPS vs MM5 AMPS Forecasts (060)



WRF-MM5 node frequencies 060

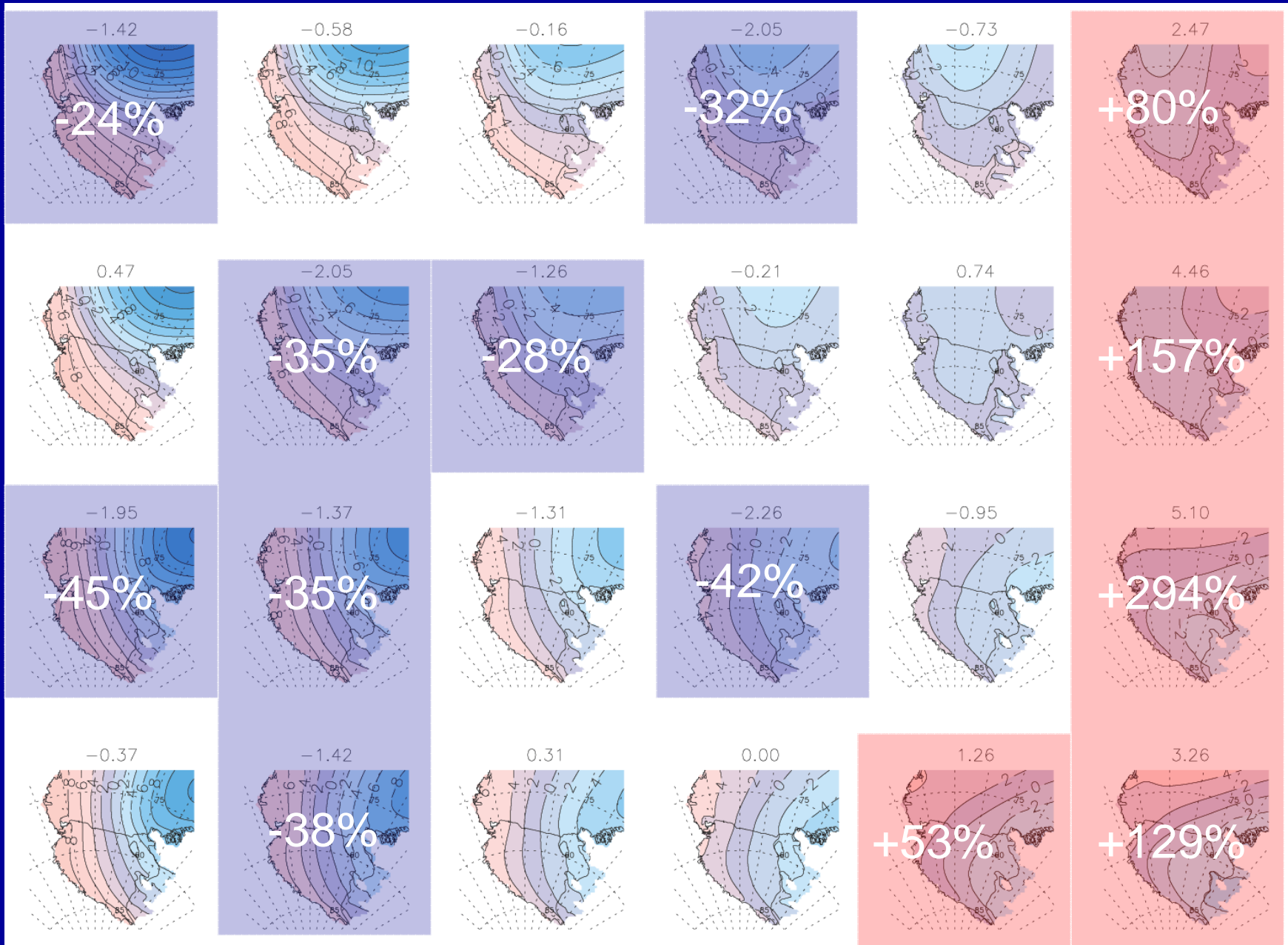
Changes in Frequency of Forecast Synoptic Patterns as a Function of Forecast Duration

WRF AMPS: 012 vs 000 Forecasts



WRF node frequencies 012-000

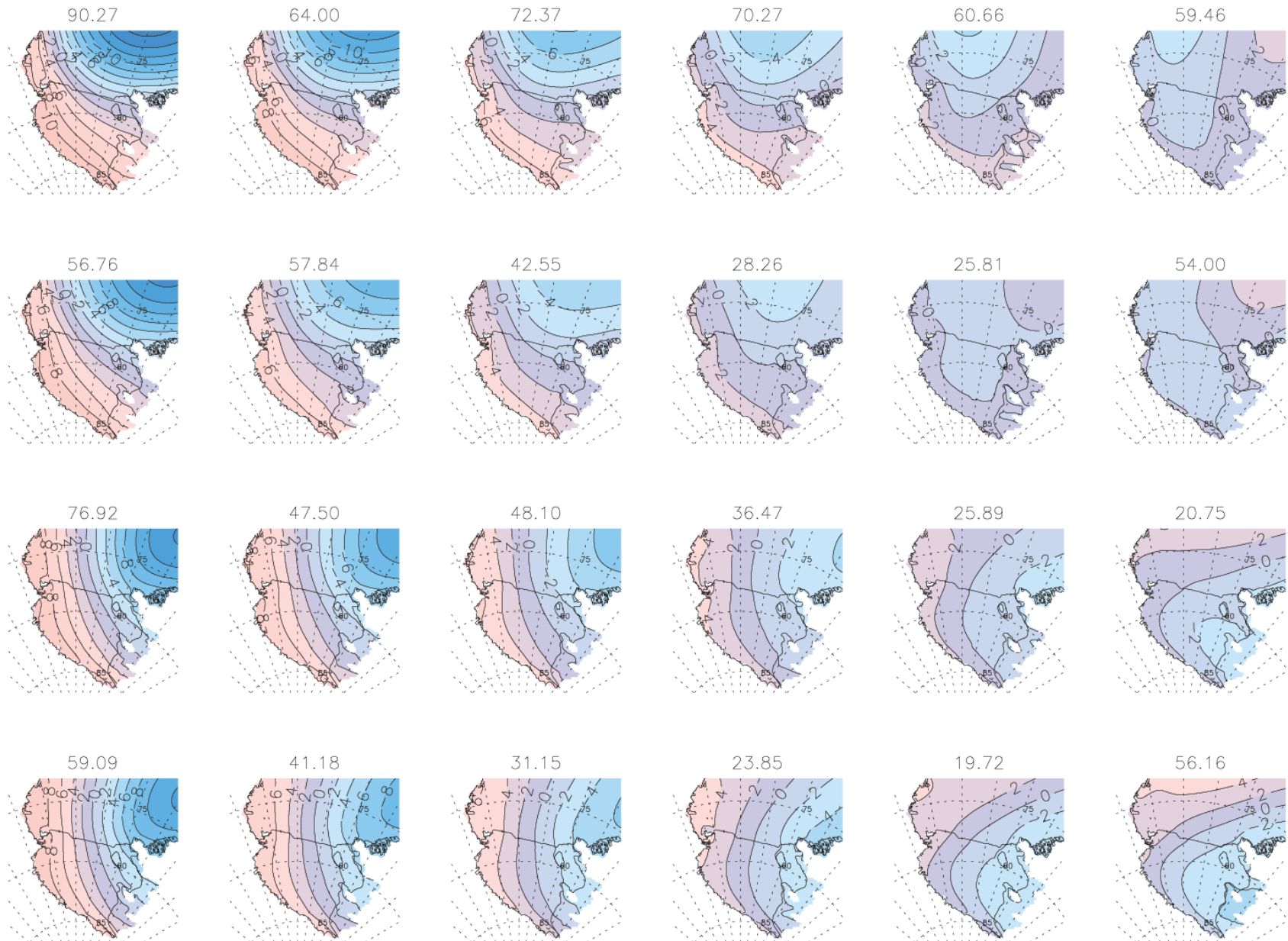
WRF AMPS: 060 vs 000 Forecasts



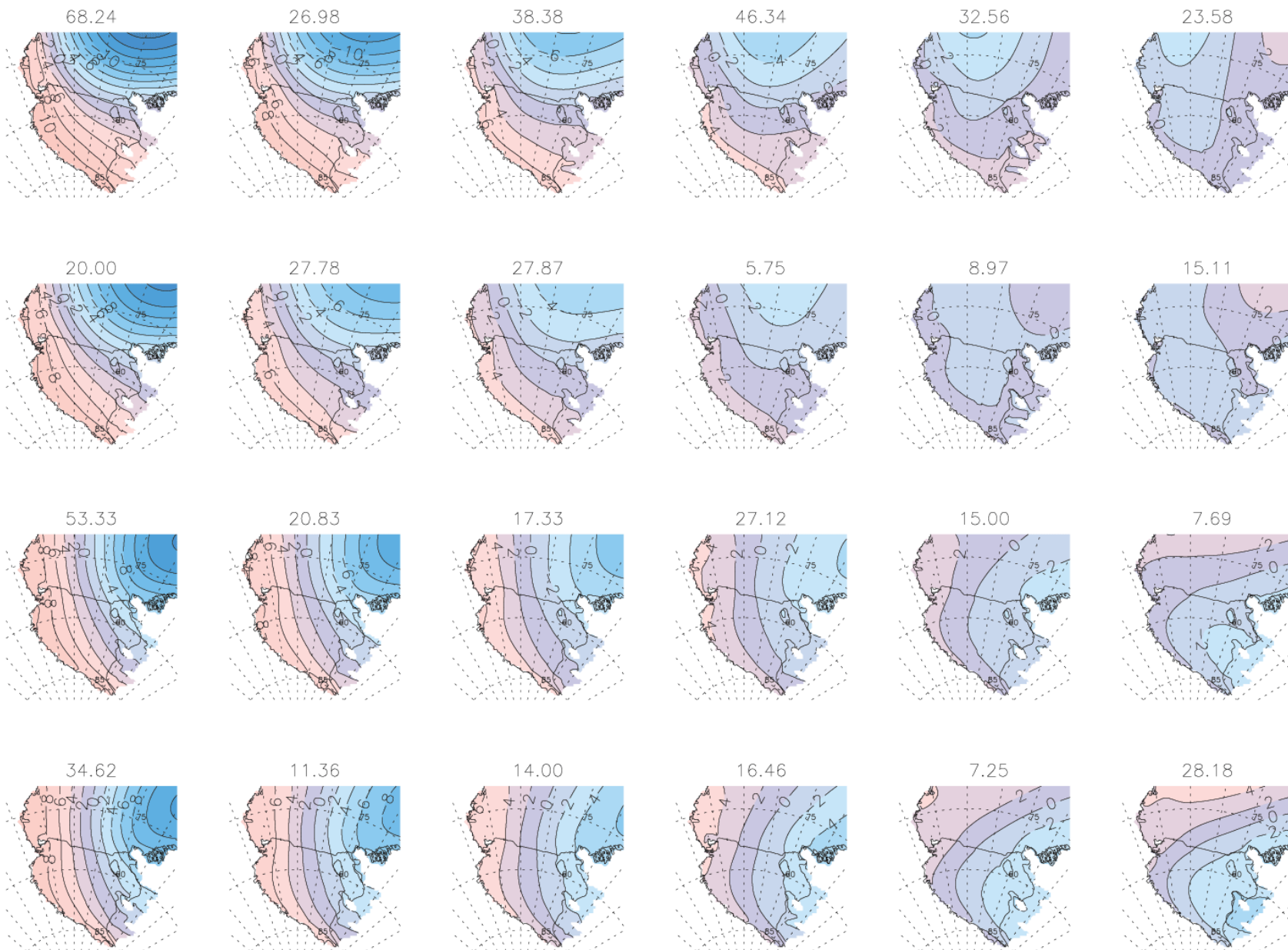
WRF node frequencies 060-000

Percent of Time Forecast
Synoptic Pattern Matches
Observed Synoptic Pattern

Percent of Time Forecast Patterns Match Obs: 012



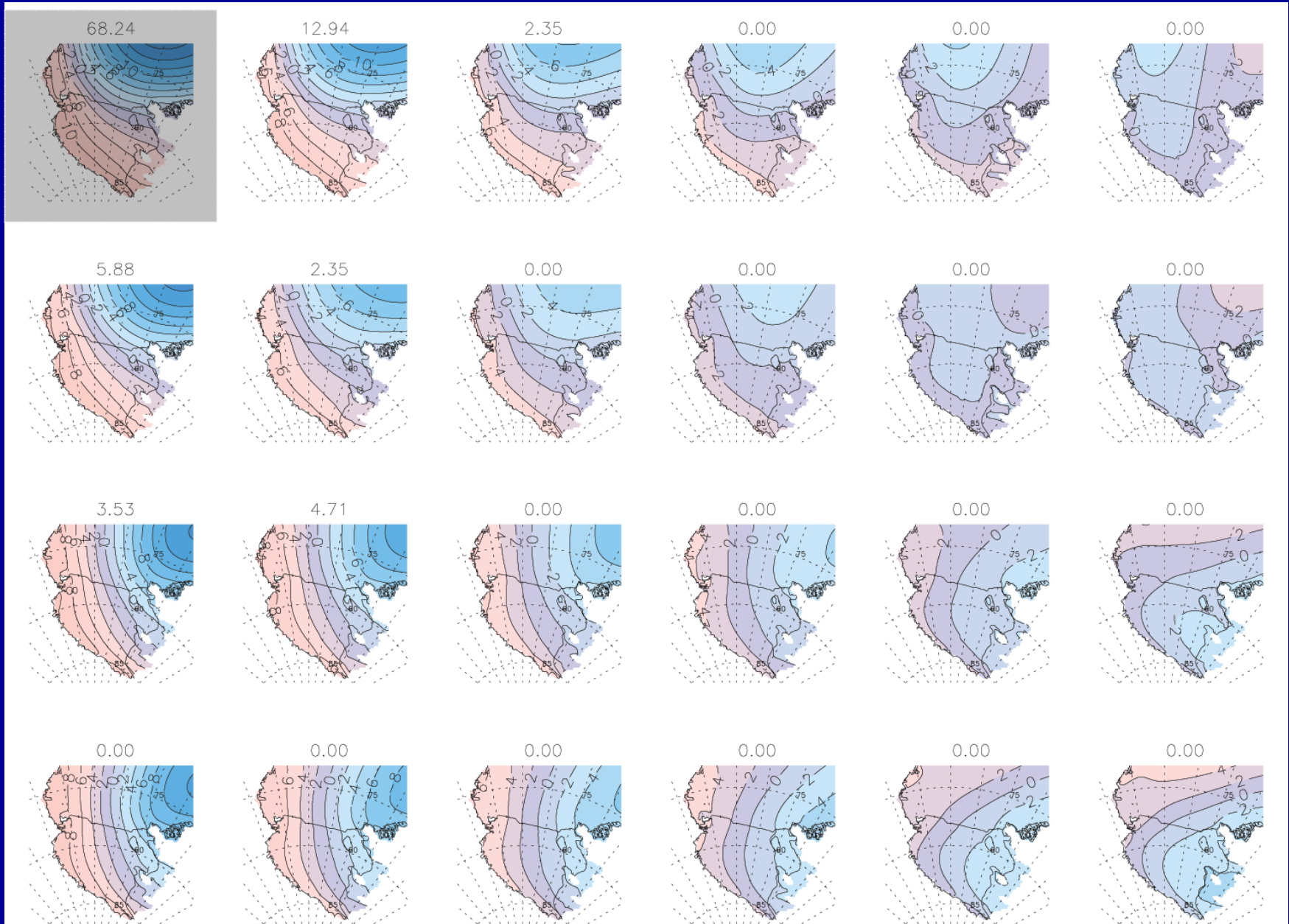
Percent of Time Forecast Patterns Match Obs: 060



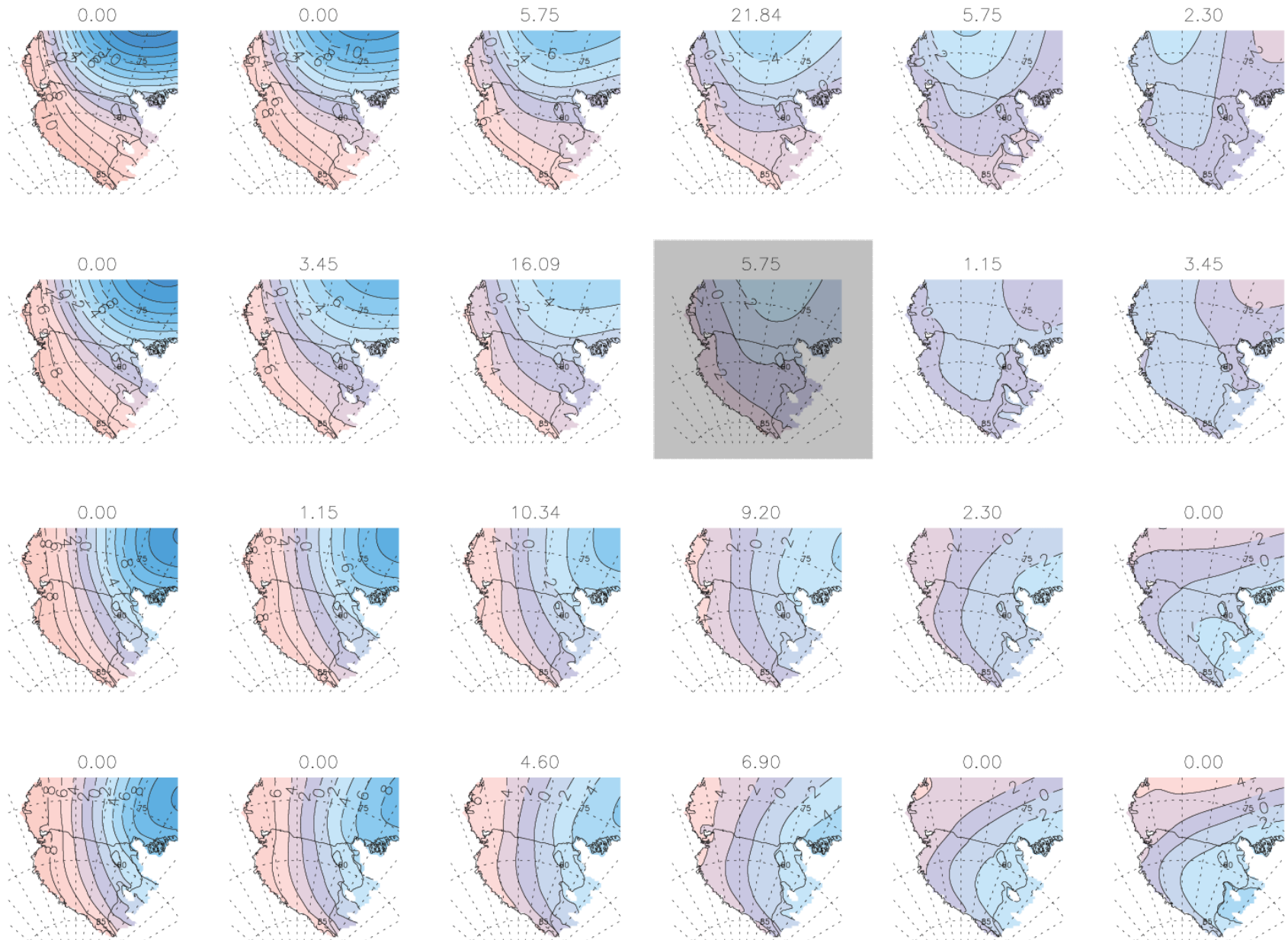
WRF corr 060-000

Misprediction of Synoptic Patterns

Misprediction of Synoptic Patterns: 060



Misprediction of Synoptic Patterns: 060



Project Goals (Part 2): Future Work

- Determine model errors for different synoptic patterns based on comparison with AWS obs
- Implement real-time SOM verification of AMPS:
 - SLP pattern identification
 - Misprediction of SLP patterns
- Develop “forecaster guide” to model errors
- Relate SOM model analysis to forecaster identified model errors

